FY 2015 Survey Results of Water Pollution by Agricultural Chemicals Used at Golf Courses

September 16, 2016

The Ministry of the Environment has collected the results of monitoring surveys of agricultural chemicals in golf course drains, which is conducted by local governments and regional environment offices in FY 2015.

The monitoring surveys were conducted in accordance with the "Tentative Guideline for the Prevention of Water Pollution by Agricultural Chemicals Used in Golf Courses", hereinafter referred to as "the Guideline". 15,902 samples from 515 golf courses were measured in the survey and no sample of the drains exceeded reference values of concentrations set in the Guideline (Table 1 and Table 2).

Table 1 Summary of survey results

Prefectures	Number of golf courses surveyed***		Number of agricultural chemicals surveyed (**and.***)		Total number of samples (*,**and.***)		The number of samples surveyed from drains		Number of samples exceeding the reference value	
Hokkaido	46	(2)	49	(6)	394	(10)	124	(4)	0	(0)
Aomori	1	(1)	5	(5)	5	(5)	5	(0)	0	(0)
Iwate	2	(2)	11	(11)	11	(11)	0	(0)	0	(0)
Miyagi	4		43		116		5		0	
Akita	2		5		6		0		0	
Yamagata	1	(1)	7	(7)	4	(4)	0	(0)	0	(0)
Fukushima	11		44		341		124		0	
Ibaraki	6	(1)	26	(3)	33	(3)	24	(3)	0	(0)
Tochigi	59		108		1,823		350		0	
Gunma	2	(2)	6	(6)	6	(6)	6	(6)	0	(0)
Saitama	28		65		553		168		0	
Chiba	7		44		243		34		0	
Tokyo	4	(1)	24	(10)	44	(10)	20	(10)	0	(0)
Kanagawa	12		33		125		108		0	
Yamanashi	1	(1)	4	(4)	4	(4)	4	(4)	0	(0)
Nagano	8		70		252		15		0	
Niigata	6		29		172		52		0	
Toyama	8		61		441		441		0	
Ishikawa	2	(2)	12	(12)	12	(11)	0	(0)	0	(0)
Fukui	5		34		51		6		0	
Gifu	5	(2)	18	(15)	28	(14)	0	(0)	0	(0)
Shizuoka	26		65		853		480		0	
Aichi	26		85		374		83		0	
Mie	3		3		6		0		0	
Shiga	2	(1)	8	(3)	15	(3)	0	(0)	0	(0)
Kyoto	10		81		204		164		0	
Osaka	29		68		546		129		0	
Hyogo	79		106		4,043		426		0	
Nara	24		42		840		385		0	
Wakayama	3		42		380		0		0	
Tottori	1		71		148		20		0	
Shimane	4		19		48		0		0	
Okayama	15		60		728		0		0	
Hiroshima	8		58		432		432		0	
Yamaguchi	2	(1)	6	(4)	8	(4)	0	(0)	0	(0)
Tokushima	1	(1)	7	(7)	6	(6)	0	(0)	0	(0)
Kagawa	12		44		480		0		0	
Ehime	2	(2)	6	(6)	5	(5)	0	(0)	0	(0)
Kochi	1	(1)	10	(10)	10	(10)	0	(0)	0	(0)
Fukuoka	12		86		1,018		375		0	
Saga	5		38		95		0	(0)	0	(0)
Nagasaki	5		58		540		0		0	
Kumamoto	8		16		45		24		0	
Oita	2		15		74		0		0	
Miyazaki	2	(2)	6	(6)	6	(6)	6	(6)	0	(0)
Kagoshima	12		76		332		58		0	
Okinawa	1	(1)	3	(3)	2	(2)	0	(0)	0	(0)
Total	515	(24)	-	-	15,902	(114)	4,068	(38)	0	(0)

Notes: * The total number of samples includes those collected from drain, pond in golf courses, and water outside of golf courses.

Notes: ** The total number of samples includes those surveyed by municipalities and reported to their prefectures.

Notes: *** Figures in brackets are results measured by regional environment offices.

Table 2　Summary of survey results of each chemical

Agricultural chemicals		Reference value (mg/L)	Concentration range detected * (mg/L)	Number of samples exceeding the reference value	Number of samples *
1	Asulam-sodium (Asulam)	10 (As in Asulam)	N.D.～0.001	0	108
2	Acetamiprid	1.8	N.D.	0	40
3	Acephate	0.063	N.D.	0	39
4	Azoxystrobin	4.7	N.D.～0.00076	0	90
5	Amisulbrom	2	N.D.	0	8
6	Ametocradin	71	N.D.	0	1
7	Alachlor	0.2	N.D.	0	11
8	Isoxathion	0.08	N.D.	0	71
9	Isoxaben	1.3	N.D.	0	4
10	Isoprothiolane	2.6	N.D.	0	68
11	Iprodione	3	N.D.	0	84
12	Iprobenfos (IBP)	0.93	N.D.	0	4
13	Imidacloprid	1.5	N.D.～0.001	0	53
14	Iminoctadine tris(Albesilate) Iminoctadine-Triacetate	0.06 (As in Iminoctadine)	N.D.	0	61
15	Imibenconazole	0.26	N.D.	0	5
16	Indaziflam	0.5	N.D.	0	2
17	Indoxacarb IndoxacarbMP	0.13 (As in Indoxacarb)	N.D.	0	1
18	Ethoxysulfuron	1.4	N.D.	0	44
19	Etofenprox	0.82	N.D.	0	33
20	Etridiazol (Echlomezol)	0.04	N.D.	0	32
21	Oxadiargyl	0.2	N.D.	0	8
22	Oxaziclomefone	0.24	N.D.	0	44
23	Oxytetracycline	0.7	N.D.	0	2
24	Oxine-Copper	0.2	N.D.～0.019	0	59
25	Cafenstrole	0.07	N.D.～0.004	0	53
26	Carfentrazone-Ethyl	0.7	N.D.	0	2
27	Quinoclamine (ACN)	0.055	N.D.	0	2
28	Captan	3	N.D.	0	59
29	Cumyluron	0.2	N.D.	0	1
30	Glufosinate Glufosinate-P-Sodium	0.24 (As in Glufosinate)	N.D.	0	5
31	Kresoxim-Methyl	9.5	N.D.	0	1
32	Clothianidin	2.5	N.D.～0.005	0	94

Agricultural chemicals		Reference value (mg/L)	Concentration range detected * (mg/L)	Number of samples exceeding the reference value	Number of samples *
33	Chlorantraniliprole	6.9	N.D.	0	33
34	Chlorimuron-Ethyl	2	N.D.	0	7
35	Chlorpyrifos	0.02	N.D.	0	50
36	Chlorothalonil (TPN)	0.4	N.D.	0	84
37	Chloroneb	0.5	N.D.	0	44
38	Cyazofamid	4.5	N.D.	0	26
39	Dicamba(MDBA) Dicamba-Potassium (MDBA-Potassium) Dicamba-Dimethylammonium (MDBA-Dimethylammonium)	9.3 (As in MDBA)	N.D.	0	6
40	Cyclosulfamuron	0.8	N.D.～0.008	0	56
41	Dithiopyr	0.095	N.D.～0.0002	0	62
42	Siduron	3	N.D.	0	58
43	Dinotefuran	5.8	N.D.	0	4
44	Difenoconazole	0.25	N.D.	0	61
45	Cyproconazole	0.3	N.D.～0.001	0	51
46	Simazine (CAT)	0.03	N.D.	0	75
47	Simeconazole	0.22	N.D.	0	45
48	Silafluofen	2.9	N.D.	0	5
49	Spinetoram	0.63	N.D.	0	1
50	Diazinon	0.05	N.D.～0.01	0	87
51	Daimuron	7.9	N.D.	0	3
52	Thiamethoxam	0.47	N.D.～0.001	0	58
53	Thiuram (Thiram)	0.2	N.D.	0	83
54	Thiodicarb	0.8	N.D.	0	66
55	Thiophanate-Methyl	3	N.D.～0.001	0	42
56	Thiobencarb	0.2	N.D.	0	3
57	Thifluzamide	0.37	N.D.～0.023	0	68
58	Tetraconazole	0.1	N.D.	0	53
59	Tebuconazole	0.77	N.D. ～0.000027	0	71
60	Tebufenozide	0.42	N.D.	0	42
61	Teflubenzuron	0.26	N.D.	0	1
62	Triaziflam	0.23	N.D.	0	13
63	Triclopyr	0.06	N.D.	0	68
64	Trichlorfon (DEP)	0.05	N.D.	0	32
65	Trinexapac-Ethyl	0.15	N.D.	0	18
66	Triflumizole	0.39	N.D.	0	43
67	Trifloxystrobin	1	N.D.	0	13

Agricultural chemicals		Reference value (mg/L)	Concentration range detected * (mg/L)	Number of samples exceeding the reference value	Number of samples *
68	Tolclofos-Methyl	2	N.D.	0	84
69	Napropamide	0.3	N.D.	0	48
70	Validamycin	12	N.D.	0	12
71	Halosulfuron-Methyl	2.6	N.D.～0.005	0	58
72	Hydoroxyisoxazol (Hymexazol)	1	N.D.	0	34
73	Bifenthrin	0.26	N.D.	0	4
74	Pyraflufen-Ethyl	4.5	N.D.	0	2
75	Pyributicarb	0.23	N.D.	0	61
76	Pyribencarb	1	N.D.	0	10
77	Pyroxasulfone	0.5	N.D.	0	2
78	Fenitrothion (MEP)	0.03	N.D.～0.0007	0	79
79	Ferimzone	0.5	N.D.	0	9
80	Butamifos	0.2	N.D.	0	57
81	Flazasulfuron	0.3	N.D.	0	59
82	Fluxapyroxad	0.55	N.D.	0	8
83	Fludioxonil	8.7	N.D.	0	20
84	Flucetosulfuron	1	N.D.	0	1
85	Flutolanil	2.3	N.D.	0	68
86	FlubeN.D.iamide	0.45	N.D.	0	21
87	Flupoxam	0.21	N.D.～0.0087	0	19
88	Flurprimidol	0.39	N.D.	0	1
89	Prodiamine	1.7	N.D.	0	18
90	Propamocarb Hydrochloride	7.7	N.D.	0	14
91	Propyzamide	0.5	N.D.	0	90
92	Prohydrojasmon	0.5	N.D.～0.004	0	82
93	Permethrin	0.2	N.D.	0	18
94	Pencycuron	1	N.D.	0	35
95	Benzyladenine	1.4	N.D.～0.029	0	86
96	Bensultap	0.9	N.D.	0	18
97	Penthiopyrad	2	N.D.	0	16
98	Pendimethalin	3.1	N.D.～0.0004	0	63
99	Penflufen	0.53	N.D.	0	3
100	Benfluralin (Bethrodine)	0.1	N.D.	0	46
101	Boscalid	1.1	N.D. ～0.000048	0	50
102	Phosethyl	23	N.D. ～0.000015	0	53
103	Foramsulfuron	13	N.D.	0	15
104	Polycarbamate	0.3	N.D.	0	12
105	Myclobutanil	0.63	N.D.	0	7

	Agricultural chemicals	Reference value (mg/L)	Concentration range detected * (mg/L)	Number of samples exceeding the reference value	Number of samples *
106	Mecoprop-Potassium Mecoprop-Dimethylammonium Mecoprop-P-Isopropylammonium Mecoprop-P-Potassium	0.47 (As in Mecoprop)	N.D.	0	67
107	Metamifop	0.11	N.D.	0	1
108	Metalaxyl Metalaxyl-M	0.58	N.D.～0.00044	0	76
109	Methoxyfenozide	2.6	N.D.	0	8
110	Metconazole	1	N.D.	0	17
111	Metolachlor S-Metolachlor	2.5 (As in Metolachlor)	N.D.～0.003	0	3
112	Mepronil	1	N.D.～0.0002	0	64
113	EPN	0.037	N.D.	0	7
114	MCPA-Isopropyl MCPA-Sodium	0.051 (As in MCPA)	N.D.	0	21
Total			-	0	4,068

Notes: * The number includes those data collected at drain outlets of golf courses.